DMS QPL 2082

PRC

protective coatings
caulking compounds
sealants • adhesives

TECHNICAL DATA SHEET

PR-1422 CLASS B

USE

A filleting compound for sealing integral fuel tanks and pressurized cabins, PR-1422 Class B was especially developed for use over a temperature range of —65°F to +275°F and with outstanding resistance to aircraft fuels (aviation gasoline or jet fuel), lubricating oils, and deterioration by saturation of Skydrol* hydraulic fluids.

DESCRIPTION

PR-1422 Class B is a two-part, polysulfide, liquid polymer compound that utilizes an advanced chemical curing system. Each lot is manufactured from carefully selected raw materials under the strictest control and thoroughly evaluated to assure conformance to rigorous specifications. The mixed compound is a highly thixotropic paste that is readily applied with an extrusion or injection gun and does not flow from vertical or overhead surfaces after application. Cure takes place at room temperature and without shrinkage to form a resilient sealant possessing excellent adhesion to aluminum, magnesium, titanium, steel, and numerous other materials. Field service tests and production applications under extremely adverse fuel and temperature environments have proven the success of PR-1422 Class B under conditions previously considered far too rigorous for polysulfide liquid polymer sealants.

SPECIFICATIONS

PR-1422 B-½ and B-2 meet the requirements of MIL-S-8802D(1), Class B-½ and B-2.

APPLICATION PROPERTIES (Typical)

(Test methods according to MIL-S-8802D(1), Class B where applicable)

COLOR: Base Compound, Light Brown; Accelerator, Black.

MIXING RATIO: 7.5:1 by weight (base compound:accelerator)

SPECIFIC GRAVITY: Base Compound, 1.35; Accelerator, 1.51.

NONVOLATILE CONTENT: 92.5% (mixed compound).

VISCOSITY: Brookfield Spindle #7 @ 2 rpm, 12,000 poises.

VERTICAL FLOW: Initial, 0.3"; 50 minutes after mixing, 0.5"; 90 minutes after mixing, 0.4".

APPLICATION LIFE AND CURE TIME:
(At 75°F, 50% RH)

	MINIMUM APPLICATION LIFE (in hours)	MAXIMUM TACK FREE TIME (in hours)	MAXIMUM TIME to 35 REX (in hours)
B-½	½	10	45
B-2	2	36	72

*Registered tradename of Monsanto Company

PURCHASING DATA

PRODUCT DESIGNATION

When ordering this product, designate PR number, class letter, and dash number as follows:

PR-1422 B-½	Minimum Application Life	30 minutes
PR-1422 B- 2	Minimum Application Life	2 hours

PACKAGING

PR-1422 Class B may be purchased in the following types of packages:

Standard Containers

Designation	Base Compounds Container	No. Per Case
½ pt. kit — 3½ fl. oz.	½-pt. can	16
½ pt. kit — 6 fl. oz.	½-pt. can	16
Pint kit — 12 fl. oz.	1-pt. can	16
Quart kit — 24 fl. oz.	1-qt. can	9
Gallon kit — 96 fl. oz.	1-gal. can	4
50 gallons	55-gal. open-top drum	..

NOTE: The fluid ounce content is the amount of base compound (128 fluid ounces per gallon). Kits are furnished with a premeasured quantity of base compound and accelerator individually packaged and assembled as a single unit. Bulk quantities of 50 gallons are accompanied by sufficient accelerator individually packaged. Kits are designed so that adequate space is available in the base compound containers for addition of accelerator and mixing.

Semkit® Two-Part Sealant Cartridges

Designation	Approximate Total Contents	Container	Kits per Case
Model 655	2 fl. oz.	2½ oz. cartridge	24
Model 654	3½ fl. oz.	6 oz. cartridge	24

NOTE: Semkit Two-Part Sealant Cartridges are furnished with a premeasured quantity of base compound and accelerator packaged in a plastic cartridge equipped for mixing the compound in the cartridge.

SHIPPING CLASSIFICATION: Caulking or Glaziers' Compound, NOI

ACCELERATED STORAGE STABILITY: After mixing, the following typical properties are obtained when base compound and accelerator have been stored separately in closed containers for 14 days at 120°F:

VISCOSITY: 15,000 poises

VERTICAL FLOW: Initial, 0.3";
50 minutes after mixing, 0.4";
90 minutes after mixing, 0.3".

PR-1422 CLASS B

APPLICATION LIFE AND CURE TIME:

	MINIMUM APPLICATION LIFE (in hours)	MAXIMUM TACK FREE TIME (in hours)
B-½	½	10
B-2	2	36

PERFORMANCE PROPERTIES (Typical)

(Test methods according to MIL-S-8802D(1), Class B where applicable)

COLOR: Brown

SPECIFIC GRAVITY: 1.45.

HARDNESS, SHORE A: 50.

THERMAL RUPTURE RESISTANCE: Retains pressure of 10 psi at 250°F with only negligible deformation both before and after immersion in Jet Reference Test Fluid.

LOW TEMPERATURE FLEXIBILITY (–65°F): Excellent, whether preconditioned at 75°F or at 275°F.

ADHESION: Peel strength (cohesive) after 7-day immersion in Jet Reference Test Fluid or 2-layer salt water/Jet Reference Test Fluid at 140°F:

	JET REFERENCE TEST FLUID	2-LAYER FLUID
Aluminum	30 lb./in. of width	35 lb./in. of width
Stainless Steel	35 lb./in. of width	35 lb./in. of width
Titanium	30 lb./in. of width	36 lb./in. of width

CORROSION RESISTANCE: No corrosion, adhesion loss, softening or blistering after 20-day immersion in 2-layer salt water/Jet Reference Test Fluid at 140°F.

FUEL RESISTANCE: After 7-day immersion in TT-S-735, Type III fluid or Grade JP-4 fuel at 140°F (fluid:sealant ratio of 300:1, with fluid changed every 24 hours). Excellent flexibility, no visible deterioration, and negligible weight loss as follows:

	14-DAY CURE
TT-S-735, Type III Fluid	3.5%
MIL-J-5624, Grade JP-4 Fuel	4.0%

After 9-day immersion in Jet Reference Test Fluid containing up to 0.015 percent by weight of n-butyl mercaptan at 140°F (fluid:sealant ratio of 300:1 with 6 fluid changes.) Excellent flexibility, no visible deterioration, and negligible weight loss as follows:

	14-DAY CURE
Jet Reference Test Fluid	8.0%

TENSILE STRENGTH AND ELONGATION: After immersion in Jet Reference Test Fluid at 140°F and high temperature exposures at 250°F as follows:

	TENSILE STRENGTH	ULTIMATE ELONGATION
Standard Cure, 28 days	260 psi	240%
Fluid, 14 days	170 psi	250%
Heat, 7 days	290 psi	150%
Fluid, 72 hours, and Heat, 7 days	350 psi	110%
Heat, 24 hours, and Fluid, 7 days	150 psi	200%

REPAIRABILITY: Excellent to both fresh sealant and heat/fuel-abraded fillets.

DYNAMIC PERFORMANCE: Passes tests of MIL-S-7502.

SKYDROL RESISTANCE: Superior, as follows:

Cure, 30 days	56
7 days in Skydrol 500 at 120°F	25
7 days in Skydrol 7000 at 120°F	50

RESISTANCE TO OTHER FLUIDS: PR-1422 Class B has excellent resistance to water, alcohols, petroleum-base and synthetic lubricating oils, and petroleum-base hydraulic fluids.

FUNGUS RESISTANCE: Non-nutrient

NOTE: The above application and performance property values are typical for the material, but are not intended for use in specifications or for acceptance inspection criteria because of variations in testing methods, conditions, and configurations.

SURFACE PREPARATION

To obtain good adhesion, the surface should be cleaned with an inhibited alkaline cleaner before subassembly of parts to remove lubricants used in manufacturing operations.

Just prior to application of the sealant, the surface should be recleaned with an oil-free solvent (reclaimed solvents should not be used) that will dissolve oil and wax. A progressive cleaning procedure should be used. Wash one small area at a time, then dry with a clean cloth before solvent evaporates to prevent redeposition of oil, wax, or other surface contaminants.

To maintain a clean solvent supply, always pour the solvent on the washing cloth.

MIXING INSTRUCTIONS

NOTE: Proper mixing and correct proportions are extremely important if optimum results are to be obtained. Mixing by experienced personnel at a central location is recommended.

I Standard Containers

A. When PR-1422 Class B is procured for use in production mixing operations and when the exclusion of air is an important factor to end performance properties, use of the Pyles 1600 Series Continuous Mixer manufactured by Pyles Industries, Detroit, Michigan or Semco Rotary Mixer #1384 manufactured by Semco, Glendale, California are recommended. The Pyles Continuous Mixer and Semco Rotary Mixer operate on the basis of a continuous delivery of mixed compound.

CONTINUOUS FLOW TYPE MIXERS

Before mixing PR-1422 Class B material in continuous flow type mixers, consult mixer manufacturer to determine if mixer is properly equipped and adjusted. When PR-1422 Class B is mixed on the Pyles 1600 Series Continuous Mixer or Semco Rotary Mixer #1384, the following requirements should be observed:

NOTE: Mechanical mixing of material with less than a 2-hour application life is not recommended.

1. Mixers must be equipped with a coolant jacket and coolant (50° ± 10°F) should be circulated continuously to prevent temperature build-up in the compound which will decrease application life.
2. Automatic metering devices must be adjusted to deliver base compound and accelerator in the ratio of 7.5 to 1 by weight. This corresponds to a volume ratio of 12.0 parts of accelerator to 100 parts of base compound. When determining mixer proportioning, base compound and accelerator lines should be disconnected between the metering unit and the mixing head so that the quantities of each delivered by the mixer can be collected and weighed to insure that the weight ratio of base compound to accelerator is 7.5 to 1. Because it may not be possible to adjust automatic metering devices to deliver an exact ratio of 7.5 to 1 by weight (base compound to accelerator), a tolerance of ±0.75 parts by weight of base compound may be used. Every effort should be made to adjust automatic metering devices to deliver base compound and accelerator as closely as possible to the 7.5 to 1 weight ratio, but if the weight ratio is from 6.75 to 8.25 parts base compound to 1 part accelerator the properties of cured PR-1422 Class B will fall within the requirements of the specifications for which it is designed. It should be pointed out that some change may be noted in the tack free time and cure rate at the extremities of the tolerance.
3. Extrusion gun cartridges should be filled directly from the mixed and used or quick frozen for refrigerated storage.

DASHER TYPE MIXERS

Other Pyles and Semco mixers used for mixing PR-1422 Class B are Dasher Mixers in the 1300 series. Dasher mixers operate on a batch principle.

When PR-1422 Class B is mixed on the Pyles or Semco Dasher Mixers in the 1300 series, the following recommendations should be observed:

NOTE: Mechanical mixing of material with less than a 2-hour application life is not recommended.

1. Mixers must be equipped with a coolant jacket and coolant (50° ± 10°F) should be circulated continuously to prevent temperature build-up in the compound which will decrease application life.
2. Automatic metering devices must be adjusted to deliver base compound and accelerator in the ratio of 7.5 to 1 by weight. This corresponds to a volume ratio of 12.0 parts of accelerator to 100 parts of base compound. After the initial setting, all adjustments must be made by weighing the base compound and accelerator delivered by the mixer to determine the correct proportion by weight. To accomplish this, disconnect the accelerator line between metering cylinder and mixing pot and the air line to the base compound pump so it cannot run. Start accelerator pump, collect, and weigh the accelerator. Reconnect all lines and fill mixing pot with accelerator and base compound and weigh. After weighing the mixture, deduct the weight of accelerator previously determined to obtain the weight of base compound. Then the weight ratio of base compound to accelerator can be calculated. Because it may not be possible to adjust automatic metering devices to deliver an exact ratio of 7.5 to 1 by weight (base compound to accelerator), a tolerance of ±0.75 parts by weight of base compound may be used. Every effort should be made to adjust automatic metering devices to deliver base compound and accelerator as closely as possible to the 7.5 to 1 weight ratio, but if the weight ratio is from 6.75 to 8.25 parts base compound to 1 part accelerator the properties of cured PR-1422 Class B will fall within the requirements of the specifications for which it is designed. It should be pointed out that some change may be noted in the tack free time and cure rate at the extremities of the tolerance.
3. To avoid streaks of unmixed compound when starting with a clean pot and dasher assembly, the pot should be buttered with a premixed material and during subsequent runs approximately one cartridge worth of material should be left in the mixing pot of 1-quart mixers and two cartridges worth of material should be left in the mixing pot of 5-quart mixers for the next run.

NOTE: It is recommended that whenever the mixer has not been in use for 30 minutes or longer the dasher assembly and mixing pot be thoroughly cleaned before mixing more sealant.

4. For best rheology properties and minimum void content, material should be mixed for 35 to 40 strokes at a rate of 5 to 6 strokes per minute for the 1-quart mixers and 2 to 3 strokes per minute for the 5-quart mixers.

NOTE: Excessive strokes or excessive stroke speed can cause breakdown in the rheology properties of PR-1422 Class B which will result in abnormal slump or sag.

5. The pot pressure should be maintained at 60 to 80 psig during mixing and the stroke rate of 5 to 6 strokes per minute should be adjusted by throttling the dasher valve or by dividing the air lines and using a separate pressure reducer on the dasher air cylinder.
6. To avoid lines of delamination and excessive air voids, it is recommended that the mixer be equipped with a stop which will permit the outlet valve to be opened only to one-quarter of full flow. Also the pot pressure should be approximately 100 psig for filling extrusion gun cartridges.
7. A wooden plug should be held firmly against the extrusion gun cartridge piston to resist flow during cartridge filling.
8. Extrusion gun cartridges should be filled directly from the mixer and used or quick frozen for refrigeration storage.

CAUTION: Mechanical mixing machines must be individually adjusted and mixing schedules worked out to give the best results for each operator. Mechanical mixing machines should be checked periodically during service to assure proper calibration and adjustment.

B. When procured in small kits or full containers, or when suitable mechanical pressure mixers are not available, PR-1422 Class B should be mixed as follows:

1. Kits consist of the proper proportions of base compound and accelerator, and the entire contents are to be mixed. When sealant is proportioned, mix 1 part (by weight) of the accelerator with 7.5 parts (by weight) of base compound.
2. Thoroughly stir the accelerator in its container until an even consistency is obtained.
3. Slowly stir the accelerator into the base compound and thoroughly mix approximately 7 to 10 minutes. Be sure to scrape the sides and bottom of the container in order to include all the compound in the mixture and to assure uniform blending. Slow mixing by hand is recommended. Mechanical mixing of material with less than a 2-hour application life is not recommended. The B-2 compound may be mixed by a slow speed mechanical mixer. A high speed mechanical mixer will generate internal heat and reduce application life.

II SEMKIT TWO-PART SEALANT CARTRIDGES

1. Wear safety glasses.
2. Hold cartridge, grasp dasher rod and pull back approximately one inch.
3. Insert ramrod into hollow of dasher rod, break piston loose and inject about 1/3 of the contents into the cartridge.

NOTE: Use even pressure; do not use force, tap, pound or jolt ramrod if piston does not break loose readily.

4. Repeat Step 2 and 3 until all of the contents of the rod are emptied into the cartridge. Then remove ramrod.
5. Hand Mix: Mix material for the total of 50 strokes; a stroke is one complete in and out cycle. Hold cartridge and rotate dasher rod 90° in a spiral clockwise motion with each stroke.
6. Machine Mix: Mix material for 1½ minutes. Remove Semkit from mixer.
7. Remove bottom cap.
8. Pull dasher rod back to neck of cartridge, grasp cartridge firmly at neck, unscrew dasher rod and remove.
9. Screw nozzle into cartridge, insert into Semco Extrusion Gun and use as required. For hand extrusion, press used dasher rod against plunger to force material from cartridge.

NOTE: It may be desired to use a Semco Portable Mixer Model 285 for mixing PR-1422 Class B in sealant cartridges. Although it does not reduce the number of strokes required for complete mixing, it does allow the material to be mixed easier and faster.

APPLICATION AND REFRIGERATED STORAGE INSTRUCTIONS

Application life is the time that the mixed compound remains suitable for application with injection or extrusion gun. Application life is always based on standard conditions of 75°F and 50% relative humidity. For every 10°F rise in temperature, application life is reduced by half, and for every 10°F drop it is doubled. High humidity at the time of mixing shortens application life.

When it is desired to store mixed PR-1422 Class B under refrigeration, use of a quick-freeze technique is recommended so as to minimize the amount of application life that would be lost in a slower cooling procedure. One successful method is to immerse the filled cartridges in a slurry of dry ice and alcohol for 10 minutes. The temperature of the sealant will drop to approximately —70°F and the cartridge may then be transferred to a storage unit maintained at —20°F or below. Mixed PR-1422 Class B may be stored for 15 days at —20°F or 30 days at —40°F. The time consumed by freezing, storing, and thawing operations reduces total application life by approximately 45 minutes. It should be noted that there will also be some reduction in application life during refrigerated storage which depends on the storage temperature and length of time.

PR-1422 Class B material with less than a 2-hour application life should not be refrigerated.

After mixing or removal from refrigerated storage and thawing, apply the sealant with an extrusion gun equipped with ⅛" to ¼" tip. Hold gun nearly perpendicular so that extruded sealant will be forced into the lip of the seam. On most applications, the fillet should be ⅛" to 3/16" thick, but heavier fillets can be applied in a single operation if necessary.

CURE

The length of the cure depends on the ambient temperature and relative humidity. The temperature/time relationship is approximately the same for curing as it is for application life. Low humidities will extend the cure time. Cure may be hastened by applying heat up to 130°F.

Although PR-1422 Class B develops a high state of cure in 14 days at 75°F (see Performance Properties), longer cure times serve to further improve its ultimate resistance to fluids, heat, and pressure. Maximum cure is usually obtained in 30 to 50 days.

TOPCOATING

PR-1422 Class B may be used with or without protective topcoats, depending on the requirements of the user. If a corrosion preventive coating, which can be applied in conjunction with the sealant is required, PR-1560-MC/MK conforming to the requirements of MIL-C-27725B is recommended. However, PR-1005-L, which conforms to the requirements of MIL-S-4383B(2), may be used as a topcoating if desired.

Unprotected fillets of PR-1422 Class B have been exposed to JP-4 fuel and aviation gasoline in the integral fuel tank sump areas of operational aircraft for periods exceeding 5 years without evidence of physical or chemical deterioration.

CLEANING OF EQUIPMENT

Wash equipment with a chlorinated solvent immediately after use or before sealant cures. Use commercial stripping compounds to remove cured sealant. Suitable compounds are available from the following companies:

B & B CHEMICAL CO., INC.	Miami, Florida
CEE BEE CHEMICAL CO., INC.	Los Angeles
KELITE CORPORATION, INC.	Los Angeles
TURCO PRODUCTS, INC.	Los Angeles
PENNWALT CORPORATION	Los Angeles
WYANDOTTE CHEMICALS CORP.	Wyandotte, Michigan

STORAGE LIFE

The shelf life of PR-1422 Class B is at least 6 months when stored at temperatures below 80°F in the original unopened containers. Slight changes in the application properties may occur during storage, but these changes should not affect the performance properties of the cured material.

HEALTH PRECAUTIONS

PR-1422 Class B and related products have been proven to be safe materials to handle when reasonable care is observed. A component of the accelerator is readily absorbed through the skin. Avoid all contact with the body, especially contact with open breaks in the skin, and ingestion. Always wash hands before eating of smoking. Polyethylene mitts and chemical-type goggles must be used when such protection is necessary. If accelerator contacts skin, flush area with warm water. Obtain medical attention in case of extreme exposure or ingestion.

NOTE: PR-1422 Class B is protected by U. S. Patent Nos. 2,787,608 and 2,964,503.

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